

REMARKS

Claims 1-40 are pending in this application. Reconsideration of the rejections in view of the amendments and the following remarks is respectfully requested.

Allowed Claims

Claims 39-40 have been allowed.

Allowable Claims

Applicants gratefully acknowledge that claims 2, 5-7 and 10-11 were merely objected to as depending from a rejected base claim, but are otherwise allowable.

Rejections under 35 USC §103(a)

Claims 1, 3, 8 and 9 were rejected under 35 USC §103(a) as being obvious over Weimer (US 2003/0040171 A1) in view of Chua et al. (US 2004/0038486 A1) .

Admitting that Weimer does not teach that the nitriding is done with a surface wave-plasma generated by a plasma nitriding method as recited in claim 1, the Examiner alleged as follows:

The Chua et al. pregrant published application (Chua) discloses a method for forming a nitride layer using a plasma nitriding method (par. 0061). The plasma nitriding method is selected from one of an ICP system, a radial line slot antenna system, an ECR system, etc. (par 61). The radial line slot antenna system is a plasma nitriding method that generates a surface wave plasma.

Weimer teaches using an ICP system, an ECR system, or other plasma nitriding systems to nitridize the silicon film (par. 008, lines 21-25). It would have been obvious . . . to nitridize the silicon film using a radial line slot antenna system, as taught by Chua, because plasma nitriding using a radial line slot antenna system is well known in the art.

Claim 1 recites, among other things, “a step of forming a silicon nitride film on the lower silicon oxide film to completely nitride the silicon film with a surface wave plasma generated by a plasma nitriding method, wherein a multilayered insulating film including at least the lower silicon oxide film and the silicon nitride film is formed.” According to the present invention, such as shown in Fig. 14, a surface wave plasma with a high-electronic density of $1 \times 10^{12} / \text{cm}^3$ or more is generated in a plasma nitriding processor. Surface wave plasma is necessary to completely nitride the thick silicon film because ECR or ICR disclosed in Weimer cannot nitride the thick silicon film.

Chua describes as follows:

The ionizing source may, for example include an inductive coil-type antenna configuration, as generally discussed above, a slotted line microwave-type ionizing source, which is also generally known as a radial line antenna source, an electronic cyclotron resonance source (ECR source), magnetron or modified magnetron-type sources, or other ionizing sources that may generally be used to facilitate plasma generation in a processing chamber.

(para 0061, lines 7-14). Here, Chua merely lists a radial line antenna source together with other sources such as ECR source, but does not teach or suggest that surface wave plasma is effective to completely nitride the thick silicon film.

Thus, Weimer and Chua do not teach or suggest, among other things, “a step of forming a silicon nitride film on the lower silicon oxide film to completely nitride the silicon film with a surface wave plasma generated by a plasma nitriding method, wherein a multilayered insulating film including at least the lower silicon oxide film and the silicon nitride film is formed,” as recited in amended claim 1.

Application No. 10/643,967
Amendment dated February 17, 2005
Reply to Office Action of December 2, 2004

For at least this reason, claim 1 patentably distinguishes over Weimer and Chua. Claims 3, 8 and 9, depending from claim 1 also patentably distinguish over Weimer and Chua, for at least the same reason.

It is submitted that nothing in the cited references, taken either alone or in combination, teaches or suggests all the features recited in each claim of the present invention. Thus all pending claims are in condition for allowance. Reconsideration of the rejections, withdrawal of the rejections and an early issue of a Notice of Allowance are earnestly solicited.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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